

E7.3-11040.

CR-133921

T-4106B

"Made available under NASA sponsorship
in the interest of early and wide dissemination of Earth Resources Survey
Program information and without liability
for any use made thereof."

EREP MONTHLY PROGRESS REPORT - NUMBER 5

Period: August 16, 1973, to September 15, 1973

INVENTORY OF FOREST AND RANGELAND RESOURCES, INCLUDING FOREST STRESS

Registration No. 418

Contract No. T4106B

(E73-11040) INVENTORY OF FOREST AND
RANGELAND RESOURCES INCLUDING FOREST
STRESS Monthly Progress Report, 16 Aug.
- 15 Sep. (Pacific Southwest Forest and
Range Experiment) 5 p HC \$3.00 CSCL 02F

N73-32219

Unclas

G3/13 01040

Principal Investigator: Robert C. Heller

Coinvestigators: Robert C. Aldrich
Frederick P. Weber
Richard S. Driscoll

Forest Service, U. S. Department of Agriculture
Pacific Southwest Forest and Range Experiment Station
P. O. Box 245
Berkeley, California 94701
(415) 841-5121 ext. 540

Technical Monitor: Ryborn R. Kirby
Experiment Development and Integration Branch
Mail Code TF6
Houston, Texas 77058

Report Written: September 15, 1973

INVENTORY OF FOREST AND RANGELAND RESOURCES, INCLUDING FOREST STRESS

EREK Monthly Progress Report

Report No. 5

Period: August 16, 1973, to September 15, 1973

Principal Investigator: Robert C. Heller

Coinvestigators: Robert C. Aldrich
Frederick P. Weber
Richard S. Driscoll

A. Overall Status

1. Atlanta, Georgia - forest inventory site (512)

This site was scheduled for an SL-3 overflight in September because no data were collected on SL-2 because of weather and malfunctions. Mr. Ryborn Kirby informed us of the option to select other possible sites near site 512 because the current ground tracks have been displaced about three degrees east of the plotted tracks. We rejected this option because of the great amount of ground and correlative data taken on our selected site (site 512). We are hopeful that this site will be covered by SL-4.

2. Black Hills, South Dakota - forest stress site (312)

The Forest Service Aero Commander aircraft was flown to this site on August 20. Color Infrared (CIR) photo coverage was obtained over the entire test site on August 26 at a scale of 1:32,000. This film has been processed and the coverage and exposure are excellent. Photo indexing has been completed and the film made ready for photo interpretation.

F. P. Weber and T. H. Waite returned to the forest stress site on September 8. They completed the final hookup of the sensors to the ERTS DCP's prior to the EREP pass on September 13, 1973, over displaced GT-59. Weather was poor at 1317 hours MDT at the time of the EREP overpass; skies were 50 to 100 percent overcast.

The silicon diode array vidicon camera was used to measure radiance and reflectance in the Black Hills on August 27, 1973. It was

directed vertically downward as was a boresighted, narrow FOV radiometer. The radiometer employed a silicon diode detector and a sensitive, high-speed amplifier. The ground track of the camera with a 25 mm lens was about 115 m for an altitude of 300 m. The width of the radiometer track was about 11 m.

Incident irradiance was measured on the top surface of the aircraft using a silicon diode and another amplifier. Simultaneous measurements were made with the three instruments using three matched sets of filters, fitting bands AA, BB, CC, and DD of the EREP S190A experiment and band 7 of the ERTS MSS.

One pass for each filter was taken over each of two flight lines in our Black Hills test site. Postmission calibration is completed and quantitative analysis still needs to be made to relate the TV responses to the forest and pasture sites overflown. The green and red filters particularly emphasized the differences between the stressed and healthy trees. In replaying the magnetic tape in the laboratory, R. W. Dana had no difficulty relating objects on the TV screen to aerial photographs.

3. Manitou, Colorado - range inventory site (313)

SL-2 S190A data were received on August 17 and has only been cursorily interpreted. Preemption of time to secure field information in support of the SL-3 mission over the Manitou site (313) diluted our time to initiate detailed analyses of SL-2 data. The resolution and exposure of the SL-2 S190A photographs are excellent. However, a very thin, discontinuous, high cirrus cloud layer over part of the site may obscure radiometric data from some of the preselected training and testing point locations. The exact impact of this problem on our total analysis plan will not be known until we plot the point locations on overlays of the photographs. SL-2 S190B, S191, and S192 data have not been received.

The multispectral-multiscale photographs of aircraft support Mission 239 have been indexed. The quality of these photographs is the best we have received for either EREP or ERTS support and for the first time include more than 95 percent cloud-free coverage of the Manitou site. Detailed analysis of either the EREP or ERAP data has not been initiated. ~~The people securing support field data are the same as those who will analyze all the data.~~

Eight man-weeks were spent on-site securing quantitative ground data in support of SL-3 (flown August 4, 1973) and the NASA and Forest Service aircraft SL-3 support missions. This consisted of quantitative measurements at 17 locations in grassland areas for amounts of live vegetation cover, bare soil, and plant litter within each location.

The sites were subjectively selected to represent at least two range condition classes within each of two different grassland systems. The data from these measurements are now being analyzed.

The Forest Service Aero Commander was used to fly very large-scale (1:600) and medium-scale (1:5,000) color and color infrared photographs of these areas on August 24 and 25. Success of the mission is not known; the film has not yet been processed.

B. Recommendations Concerning Decisions Required to Ensure Attainment of Experiment's Scientific Objectives

All requested EREP and ERAP data of Site 313 have either been received (SL-2) or are being processed (SL-3) by NASA. We have no specific recommendations to make until we get further into our planned analysis program.

C. Expected Accomplishments

Some preliminary results of plant community and land-use classification using SL-2 S190A data should be forthcoming during the next reporting period.

D. Significant Results, Practical Applications and Operational Problems

Apparent communication problems resulted in misinterpretation of C-130 aircraft support for task/site 161313. Originally requested support by this aircraft was for SL-3; no request was made for SL-2. However, C-130 aircraft data was mistakenly flown for SL-2 and we were not contacted in sufficient time to rectify the error. No C-130 aircraft data were flown for support of SL-3.

E. Summary Outlook

We plan to maintain our original statement of work, at least until we review the remainder of the SL-2 data, the SL-3 data, and the aircraft support data for SL-3.

F. Travel Plans - September 16 to October 15, 1973

Based on current information regarding cloudy weather over the Black Hills site (312) on September 13, 1973, Weber and Waite are planning to remain on the site until September 18 when another SL-3 overpass is scheduled. Contacts have been made with ERAP missions managers concerning RB-57 and C-130 flights.

R. C. Heller is traveling of official time but at own expense to a remote sensing meeting being held in Freiburg, Germany, from September 17 to 21. This meeting is being conducted under the aegis of the International Union of Forest Research Organization. About 50 people from many countries will be attending.